WE CLAIM:

1.   A voice communication system, comprising:

a plurality of telephone sets connected to termination equipment which terminates said plurality of telephone sets, and

respective packet network telephone gateways connected to said termination equipment and to a packet network whereby said packet gateways are connected to multiplex voice telephone calls among said plurality of telephone sets to a single transport level connection and/or packet.

2.   The system of claim 1, wherein said packet network is the Internet.

3.   The system of claim 1, wherein a central office comprises said termination equipment.

4.   The system of claim 1, wherein a private branch exchange comprises said termination equipment.

5.   The system of claim 2, wherein said packet network telephone gateways operate to establish a packet network connection in response to a request from a user associated with one of said telephone sets and said gateways establish a channel for each user within each said transport level connection.

6.   The system of claim 5, wherein said packet network telephone gateways operate to digitize voice signals from said telephone sets, to multiplex blocks of such digitized voice signals onto a transport level connection, and to packetize said multiplexed voice signals.

7. The system of claim 6, wherein said telephone gateways are connected to provide channel identification for each said channel.

8. The system of claim 7, wherein said telephone gateways are connected to send sequence numbers in setup and teardown messages to allow for re-use of channel identifications.

9. The system of claim 8, wherein said telephone gateways are connected to derive the length of a payload block from payload type information included withina packet header.

10. The system of claim 9, wherein said telephone gateways are connected to indicate a channel ID with a binary bitmask representation of a particular channel corresponding to a user.

11. The system of claim 10, wherein said binary representation includes an escape bit to permit an expansion of the number of channel identifications.

12. The system of claim 11, wherein said Internet telephone gateways are connected to employ a bitmask to indicate the presence or absence of a channel within a packet.

13. The system of claim 12, wherein said Internet telephone gateways employ a counter to synchronize the interpretation of said bitmask.

14.   The system of claim 13, wherein said telephone gateways employ a timestamp offset to indicate the timing of block of data associated with each channel, said timestamp offset being relative to an absolute timestamp.

15.   The system of claim 14, wherein each said packet contains a single timestamp value that is valid for all the channels having data blocks within the packet, and each packet includes a unique identifier, with the identifier being the same in two packets along the same timestamp sequence.

16.   The system of claim 15, wherein said binary representation employs eight bits.

17.   The system of claim 15, wherein said binary representation includes an escape bit to permit an expansion of the number of channel identifications.

18.   The system of claim 15, wherein said Internet telephone gateways are connected to employ a counter to update the association of a channel with system users.

19.   A telecommunications system employing the Internet in the routing of telecommunications information from an origination point to a destination point comprising:

a plurality of communications switches; and

a plurality of gateways for interfacing respective ones of communications switches with the internet such that communications information received from different origination points and exchanged between ones of the gateways in multiplexed at the same transport level connection and in one data packet that is sent over the Internet.

20.   A telecommunciations system employing the Internet in the routing of telecommunications information from an origination point to a destination point comprising:

a plurality of communications switches; and

a plurality of gateways for interfacing respective ones of the communications switches with the Internet such that communications information received from different origination points and exchanged between ones of the gateways is multiplexed at the same transport level connection and in different data packets that are sent over the Internet.